

Docket No. 132407-2

BEST AVAILABLE COPY**REMARKS**

Claims 1-5 and 7-15 were pending in the present Application. Of these, Claims 7-14 were previously withdrawn from consideration.

Claims 4 and 5 have been amended to address the informalities noted by the Examiner. It is believed that the amendments made herein may be properly entered at this time, i.e., after final rejection, because the amendments do not require a new search or raise new issues and reduce issues for appeal. No new matter has been introduced by these amendments.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections under 35 USC §112

The rejection of Claims 4 and 5 have been rendered moot in view of the amendments thereto. Accordingly, the rejection should be withdrawn.

Claim Rejections Under 35 U.S.C. §103(a)

Claims 1-5 and 15 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Anand in view of US Patent No. 6,884,205 to VanNoy et al. (hereinafter "VanNoy") and US Patent No. 5,271,965 to Browning (hereinafter "Browning"). Applicants respectfully traverse this rejection.

Anand is generally directed to a method for producing a tungsten-carbide/cobalt/chromium alloy coating comprising a hardness from about 870 to about 980 DPH and a roughness from about 190 to about 200 AA. There is no disclosure of a high velocity air process for depositing these coatings, which uses considerably less oxygen and a much lower temperature.

VanNoy is generally directed to coating web rollers so as to prevent surface defects from being transferred to a conveyed web.

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Browning is generally directed to a thermal spray process.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

A prima facie case of obviousness has not been established because the cited references fail to teach or suggest the claimed erosion resistant coating comprising, *inter alia*, a thickness greater than 500 microns. Applicants have unexpectedly discovered that the high velocity air fuel process permits the deposition of tungsten carbide grains in a chromium cobalt matrix having a thickness greater than 500 microns. It was unexpected that coatings could be made in excess of 500 microns based on what has been done in the prior art. For example, as noted by Applicants in its background section, prior art thermal spray coatings in excess of 500 microns using an HVOF process as an example resulted in spallation, cracking, and the like. The prior art fails to teach or suggest coating thicknesses of WC-CoCr greater than 500 microns using HVAF.

The Examiner refers to VanNoys as providing support for suggesting that HVAF could be used for coatings in excess of 500 microns based on the following passage:

According to this surface finish, heights (h) of rounded up features 14 are produced in the range of about 0.0001 to 0.004 inches.

(VanNoys, Col. 4, ll. 63-65)

However, *converting 0.0001 to 0.004 inches to microns results in a range of 2.5 microns to 101.6 microns*, which is significantly less than the claimed coating thickness greater than 500 microns. Thus, there is no teaching or suggestion that the coatings in excess of 500 microns could be obtained with this process. None of the prior art references, individually or in combination, teach or suggest WC-CoCr coatings in excess of 500 microns. Moreover, the state of the art at the time the application was filed suggested that coatings in excess of 500 microns would exhibit coating defects such as spallation, delamination, cracking and the like.

Moreover, it should be noted that the other passage referred to by the Examiner (VanNoys,

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Col. 6, ll. 23-25) to provide support that WC-CoCr coatings can be coated using HVAF refers to a WC-Co coating, which is not the same as WC-CoCr coatings. As discussed in Applicants' specification at paragraph [0023], the "presence of Cr has been found to limit the dissolution of primary WC during the HVAF spraying process and ensure higher retention of the primary WC phase." The examiner refers to the following passages as evidence of support that Van Noy's discloses "the use of these kinds of WC-CO coatings within the claimed thickness that can be coated by HVAF technique. (see Office Action dated 4/24/2006, Page 2, item 4).

Browning is similar in that it teaches that HVAF provides improved quality relative to HVOF deposited coatings of WC-Co. There is no teaching or suggestion in the cited references of a plurality of tungsten carbide grains embedded in the cobalt chromium matrix (i.e., WC-CoCr), wherein the grains are less than about 2 microns in diameter; and wherein the erosion resistant coating has a thickness greater than about 500 microns and is deposited with a high velocity air fuel process. Applicants' claims are limited to a specific composition that includes chromium. In view of the foregoing, a case of prima facie obviousness is clearly not supported by these references.

A finding of "obvious to try" does not provide the proper showing for an obviousness determination. The requirement for a determination of obviousness is that "both the suggestion and the expectation of success must be founded in the prior art, not in applicant's disclosure" (emphasis added). *In re Dow Chem.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988). An Examiner, then, cannot base a determination of obviousness on what the skilled person in the art might try or find obvious to try. Rather, the proper test requires determining what the prior art would have led the skilled person to do. The prior art does not lead one skilled in the art to form erosion resistant coatings comprising a matrix comprising cobalt chromium, wherein the cobalt is at about 4 to about 12 weight percent, and the chromium is at about 2 to about 5 weight percent, wherein the weight percents are based on a total weight of the coating; a plurality of tungsten carbide grains embedded in the cobalt chromium matrix, wherein the grains are less than about 2 microns in diameter; and wherein the erosion resistant coating has a thickness greater than about 500 microns and is deposited with a high velocity air fuel process.

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In view of the foregoing, the rejection is requested to be withdrawn.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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By 

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